Effect of *Helicobacter pylori*, black tea and sodium bicarbonate on iron metabolism and MDCK cell survival

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Abstract

Background: Iron deficiency anemia is the most common nutritional disorder in the world. Diet and *Helicobacter pylori* infection are among the main causes of this disorder.

Objective: In this study, the effect of black tea extract and sodium bicarbonate with *Helicobacter pylori* on the genes involved in iron absorption and storage, as well as cell proliferation, were studied.

Methods: Simultaneous cultivation of MDCK and *Helicobacter pylori* cell lines was performed at concentrations of 10, 20, 40 and 80 µg/ml of tea extract and 30, 40, 60 and 100 mM sodium bicarbonate at 24 and 48 hours. The effect of treatment on cell survival was investigated by trypan blue staining and expression of *MYC*, *TFRC*, *FTH1*, *IRP2*, *IRP1*, and *NDRG1* genes by real-time PCR and analyzed by ANOVA and independent T-test.

Findings: There was no significant change in the expression of the genes involved in iron metabolism under the influence of tea, sodium bicarbonate and *Helicobacter pylori* treatment in MDCK cell line. Upregulation *MYC* gene expression was observed in the presence of *Helicobacter pylori* after 24 hours treatment with tea extract, and sodium bicarbonate, and in the absence of *Helicobacter pylori* upregulation with tea extract after 48 hours ($P<0.05$). Also upregulation *NDRG1* gene expression was seen after tea extract treatment of cells with or without *Helicobacter pylori* in both 24 and 48 h ($P<0.05$).

Conclusion: Sodium bicarbonate and tea each one alone didn't not influence iron status. This study suggests that reduction of tea intake could be served as a risk prevention strategy.

Keywords: Iron, Tea, Sodium bicarbonate, *Helicobacter pylori*

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